Polynomial Special Products

❖ Product of Sum and Difference

$(a+b)(a-b) = a^2 - b^2$

- ➢ equal to the square of "a" minus the square of "b"

Example:

$(5s^4t^3 + 11x^4y^3)(5s^4t^3 - 11x^4y^3)$

↳ $a = 5s^4t^3$; $b = 11x^4y^3$

↳ $a^2 - b^2$

$= (5s^4t^3)^2 - (11x^4y^3)^2$

$= \mathbf{25s^8t^6 - 121x^8y^6}$

$\left(\frac{x^2y^3}{2z^4} + \frac{3r^6}{6s^4t^6}\right)\left(\frac{x^2y^3}{2z^4} - \frac{3r^6}{6s^4t^6}\right)$

↳ $a = \frac{x^2y^3}{2z^4}$; $b = \frac{3r^6}{6s^4t^6}$

↳ $a^2 - b^2$

$= \left(\frac{x^2y^3}{2z^4}\right)^2 - \left(\frac{3r^6}{6s^4t^6}\right)^2$

$= \mathbf{\frac{x^4y^6}{4z^8} - \frac{9r^{12}}{36s^8t^{12}}}$

$(106)(94)$

↳ $106 = 100 + 6$; $94 = 100 - 6$

↳ $a = 100$; $b = 6$

↳ $a^2 - b^2$

$= (100)^2 - (6)^2$

$= 10000 - 36$

$= \mathbf{9964}$